

Amendment to the Claims

Please cancel claims 7, 10, 12-13, 18, 30-34, 37 and 39-51, amend claims 1-6, 8, 11, 14-17, 19-29, 35-36 and 38, and add new claim 54.

1 (currently amended). An isolated nucleic acid molecule comprising a nucleic acid sequence selected from the group consisting of:

a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof,

~~or isolated nucleic acid molecule comprising a nucleic acid sequence that encodes a fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof, linked to a wherein the non-IL-15 signal peptide that is from a gene that is from the same species as the IL-15;~~

a nucleic acid sequence that encodes IL-15 protein or a functional fragment thereof and a nucleotide sequence that encodes CD40L or a functional fragment thereof;

a nucleic acid sequence that encodes a fusion protein that consists of a non-IgE protein sequences linked to a IgE signal peptide that is from the same species as the non-IgE protein; and

a nucleic acid sequence that encodes a fusion protein that consists of a non-IgE protein sequences linked to a IgE signal peptide wherein the non-IgE protein is an immunomodulating protein.

2 (currently amended). The isolated nucleic acid molecule of claim 1 that encodes wherein the non-IL-15 signal peptide is an IgE signal peptide.

3 (currently amended). The isolated nucleic acid molecule of claim 1 that encodes a wherein the fusion protein that consists of a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof.

4. (currently amended). The isolated nucleic acid molecule of claim 1 that encodes 1-3 wherein said IL-15 protein or a functional fragment thereof that is IL-15 protein free of IL-15 signal peptide, or a functional fragment of IL-15 protein free of IL-15 signal peptide.

5 (currently amended). The isolated nucleic acid molecule of claim 1 1-4 wherein the nucleic acid sequence that encodes the IL-15 protein or functional fragment thereof is free of IL-15 Kozak region and/or IL-15 5' untranslated region and/or IL-15 3' untranslated region.

6 (currently amended). The isolated nucleic acid molecule of claim 1-5 1 comprising a nucleic acid sequence selected from the group consisting of:

a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof, and

a nucleic acid sequence that encodes a fusion protein that comprises IL-15 protein or a functional fragment thereof, linked to a non-IL-15 signal peptide that is from a gene that is from the same species as the IL-15;

wherein said isolated nucleic acid molecule further comprises comprising a nucleotide sequence that encodes CD40L or a functional fragment thereof.

7 (cancelled)

8 (currently amended). The isolated nucleic acid molecule of claim 1-7 1 wherein said isolated nucleic acid molecule comprises a nucleic acid sequence selected from the group consisting of:

a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof,

a nucleic acid sequence that encodes a fusion protein that comprises IL-15 protein or a functional fragment thereof, linked to a non-IL-15 signal peptide that is from a gene that is from the same species as the IL-15; and

a nucleic acid sequence that encodes IL-15 protein or a functional fragment thereof and a nucleotide sequence that encodes CD40L or a functional fragment thereof;

and further comprises comprising a nucleic acid sequence that encodes an immunogen.

9 (original). The isolated nucleic acid molecule of claim 8 wherein said immunogen is a pathogen antigen, a cancer-associated antigen or an antigen linked to cells associated with autoimmune diseases.

10 (canceled).

11 (currently amended). The isolated nucleic acid molecule of claim ~~10~~ 9 wherein said immunogen is a pathogen antigen is from a pathogen selected from the group consisting of HIV, HSV, HCV, and WNV.

12-13 (canceled).

14 (currently amended). The isolated nucleic acid molecule of ~~claims 1-13~~ claim 1 wherein said isolated nucleic acid molecule is a plasmid.

15 (currently amended). The nucleic acid molecule of ~~claims 1-13~~ claim 1 incorporated into a viral vector.

16 (currently amended). A composition selected from the group consisting of:
a composition comprising a nucleic acid molecule of claim 1-15 1 and a nucleic acid molecule that comprises a nucleic acid sequence that encodes an immunogen; and
a composition that comprises a nucleic acid molecule that comprises a nucleic acid sequence that encodes IL-15 protein and a nucleic acid molecule that comprises a nucleotide sequence that encodes CD40L protein.

17. (currently amended). The composition of claim 16 wherein said composition comprises a nucleic acid molecule that encodes an immunogen, wherein said immunogen is a pathogen antigen, a cancer-associated antigen or an antigen linked to cells associated with autoimmune diseases.

18 (canceled).

19 (currently amended). The composition of claim 17 ~~18~~ wherein said immunogen is a pathogen antigen is from a pathogen selected from the group consisting of HIV, HSV, HCV, and WNV.

20 (currently amended). A composition comprising
a nucleic acid molecule of claim 1, wherein said nucleic acid molecule
comprises a nucleic acid sequence selected from the group consisting of:
a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof, and
a nucleic acid sequence that encodes a fusion protein that comprises a IL-15 protein or a functional fragment thereof, linked to a non-IL-15 signal peptide that is from a gene that is from the same species as the IL-15; and
a nucleic acid molecule further comprises a nucleotide sequence that encodes CD40L.

21 (currently amended). An injectable pharmaceutical composition comprising the nucleic acid molecules of ~~claim 1, claims 1-15 or the composition of claims 16-20.~~

22 (currently amended). An recombinant vaccine comprising the nucleic acid molecules of ~~claims 1-13~~ claim 1.

23. (currently amended). The recombinant vaccine of claims 22 wherein said recombinant vaccine is a recombinant vaccinia vaccine.

24 (currently amended). A live attenuated pathogen wherein comprising the nucleic acid molecules of ~~claims 1-13~~ claim 1.

25 (currently amended). A fusion protein selected from the group consisting of:
a non-immunogenic fusion protein that comprises a non-IL-15 signal sequence linked to an IL-15 protein sequence; and or
a fusion protein that comprises an IL-15 protein sequence linked to a non-IL-15 signal sequence ~~that linked to an IL-15 protein sequence wherein the non-IL-15 signal sequence is from~~ of the same species as the IL-15 protein sequence;
a fusion protein comprising an IgE signal peptide linked to non-IgE protein wherein the IgE signal peptide and the non-IgE protein are derived from the same species of animal; and
a fusion protein comprising an IgE signal peptide linked to non-IgE protein wherein the non-IgE protein is an enzyme or a functional fragment thereof or an immunomodulating protein or a functional fragment thereof.

26 (currently amended). The fusion protein of claim 25 wherein the non-IL-15 signal sequence is an IgE signal sequence.

27 (currently amended). The fusion protein of claim 25 or 26 consisting of a non-IL-15 signal sequence linked to an IL-15 protein sequence.

28 (currently amended). The fusion protein of claim 25 ~~claims 25-27~~ wherein the IL-15 protein sequence is free of IL-15 signal sequence.

29 (currently amended). The A composition of claim 16 that comprises a nucleic acid molecule that comprises: a nucleic acid sequence that encodes IL-15 protein and a nucleic acid molecule that comprises a nucleotide sequence that encodes CD40L protein; wherein said composition further comprises a nucleic acid sequence that encodes an immunogen.

30-34 (canceled).

35 (currently amended). A method of modulating an immune response in an individual comprising administering to said individual a composition of ~~claims 58 or 63~~ selected from the group consisting of:

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof,

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes a fusion protein that comprises IL-15 protein or a functional fragment thereof, linked to a non-IL-15 signal peptide that is from a gene that is from the same species as the IL-15,

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes IL-15 protein or a functional fragment thereof and a nucleotide sequence that encodes CD40L or a functional fragment thereof,

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes IL-15 protein and a nucleic acid molecule that comprises a nucleotide sequence that encodes CD40L protein,

a composition comprising a non-immunogenic fusion protein that comprises a non-IL-15 signal sequence linked to an IL-15 protein sequence, and

a composition comprising a fusion protein that comprises an IL-15 protein sequence linked to a non-IL-15 signal sequence that is from the same species as the IL-15 protein sequence.

36 (currently amended). A method of inducing an immune response in an individual against an immunogen comprising administering to said individual a composition of ~~claims 59, 62 or 64-67~~ selected from the group consisting of:

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof, and further comprises a nucleic acid sequence that encodes an immunogen;

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes a fusion protein that comprises IL-15 protein or a functional fragment thereof, linked to a non-IL-15 signal peptide that is from a gene that is

from the same species as the IL-15 and further comprises a nucleic acid sequence that encodes an immunogen; and

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes IL-15 protein or a functional fragment thereof and a nucleotide sequence that encodes CD40L or a functional fragment thereof, and further comprises a nucleic acid sequence that encodes an immunogen.

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes a non-immunogenic fusion protein that comprises a non-IL-15 signal peptide linked to IL-15 protein or a functional fragment thereof, and further comprises a nucleic acid molecule that comprises a nucleic acid sequence that encodes an immunogen;

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes a fusion protein that comprises IL-15 protein or a functional fragment thereof, linked to a non-IL-15 signal peptide that is from a gene that is from the same species as the IL-15 and further comprises a nucleic acid molecule that comprises a nucleic acid sequence that encodes an immunogen; and

a composition comprising a nucleic acid molecule that comprises a nucleic acid sequence that encodes IL-15 protein or a functional fragment thereof and a nucleotide sequence that encodes CD40L or a functional fragment thereof, and further comprises a nucleic acid molecule that comprises a nucleic acid sequence that encodes an immunogen.

37 (canceled).

38 (currently amended). The An isolated nucleic acid molecule of claim 1 wherein said isolated nucleic acid molecule comprises comprising a nucleic acid sequence that encodes a fusion protein that consists of an IgE signal peptide linked to non-IgE protein sequences wherein the non-IgE protein is an enzyme or functional fragment thereof.

39-51 (canceled).

52 (original). An in vitro cell culture that comprises cells that comprise a nucleic acid molecule comprising a nucleic acid sequence that encodes a fusion protein that consists of an IgE signal peptide linked to non-IgE protein sequences wherein the nucleic acid sequence is operably linked to regulatory elements required for expression in said cells.

53 (original). A method of preparing a non-IgE protein comprising culturing cells that comprise cells that comprises cells that comprise a nucleic acid molecule comprising a nucleic acid sequence that encodes a fusion protein that consists of an IgE signal peptide linked to non-IgE protein sequences wherein the nucleic acid sequence is operably linked to regulatory elements required for expression in said cells under condition necessary for fusion protein expression for a period sufficient for said cells to express said fusion protein.

54 (new). An injectable pharmaceutical composition comprising the composition of claim 16.